

# Factors Affecting the Nutritional Status of Primary School Pupils in Kwara State, Nigeria

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**Abstract** Nutrition remains a major aspect of growth and health, better nutrition is associated with improving infant, child and maternal health, robust immune systems, harmless pregnancy and childbirth, low risk of non-communicable sicknesses and longevity. This paper presented some factors affecting the status of nutrition in primary school pupils aged 5–19 years in Kwara, Nigeria. A descriptive method of the survey type was used for the study. The population size of 818,554 out of which 1,322 were sampled by applying a multi-stage sampling procedure. The instruments employed in the study were adopted from the 2007 World Health Organization Nutrition Survey to identify the nutritional status of the pupils. Nutritional status by z-scores of height-for-age (HAZ), weight-for-height (WHZ) and weight-for-age (WAZ), estimating the prevalence of stunting, wasting, underweight and overweight. Frequency counts and percentages were used to organize the demographic variables while chi-square and Pearson's Product Moment Correlation Coefficient were used to test the hypotheses at 0.05 level of significance. The data from 1,320 respondents who duly completed and returned the questionnaire were analyzed and reported. The findings showed that 66.7% of the primary school pupils in Kwara State, Nigeria were underweight, while 29.9%, 3.1% and 0.2% were normal, overweight and obese respectively on comparing their BMI distribution with the World Health Organization reference survey using z score for ages 5-19. In addition, stunting and wasting were shown to persist (among the underweight children, 66.7%); proposing that other nutrient deficits or risk factors may be constraining linear growth for a substantial proportion of pupils. Furthermore, all the risk factors have a very strong positive relationship with the pupils' nutritional status with 0.942, 0.833, 0.735, 0.475, 0.426 for intestine parasitic infection, parental nutrition knowledge, parental education, parental income, birth order, while food security had a weak positive relationship of 0.297. Based on the findings, it was recommended that health educators, health workers and nutritionists should sensitize parents, especially mothers on stunting, wasting and underweight rates of their children and provide specific information as regards healthy lifestyle changes in their dietary patterns, which may help improve their children's nutritional status.

**Keywords:** nutritional status, Kwara state, Nigeria pupils

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## 1. Introduction

Over the decades, food nutrition has been identified as a major health challenge in developing economies, including Nigeria [1,2]. Nutrition in Nigeria presents a complex predicament; the problem of nutritional deficiencies is not only a result of insufficient food; but also a result of poor food choices among those who can afford to buy them [3]. Nutrients are constituents of food that perform important functions in the body [4]. Sufficient nutrition in early stages and early childhood is essential to the development of each child's full potential [5,6]. If all important nutrients are available in the correct

amounts and proportions as required by the body, this is referred to as optimum nutrition or adequate nutrition [7]. Optimum nutrition is needed to keep up good health. If a person does not get enough of any nutrient in the diet in sufficient amounts or gets too much of a nutrient over time [6], the person may exhibit signs of under-nutrition or over-nutrition respectively [8,9].

Problems with nutrition are generally not given thoughtfulness until a severe stage or noticeable clinical symptoms happen [10]. The primary-aged children's nutrition (age 5-19 years) requires so much consideration since they are in the growing phase of life where growth is fast and the nutrient needs are relatively high. The children's appropriate growth and development depend on the quality of food consumed. Adequate and balanced

diets are required for the functioning of proper cells, good immune system development and normal functioning of the brain in children. Many disorders in the growth of some pupils may be a result of the nutrients that are deficient or taken abundantly. Survival and avoidance of malnutrition in a child require appropriate nutrition and satisfactory health care during the first few years of life [11].

Malnutrition is predicted to have been responsible for over one-third of most child deaths, even if it is barely documented as the direct cause [12]. Globally, technology and science inventiveness are necessary to decide on the listed problems like high food costs, recession in the economy, higher struggle for climate change and natural resources. Kwara State is situated in the north-central of Nigeria on the western border of Nigeria with Benin with 16 local government areas (LGAs), it had 3.1 million population in 2016. Men accounted for 57% (1.55 million) of this population. The state is largely rural having more than 80% of the population living in rural areas. Kwara State has abundant natural resources and good climatic conditions suitable for agriculture.

The major occupation in the state is peasant farming and petty trading. Most staple foods are imported from neighboring states as food production and trading (the main occupation in rural areas) have noticeably reduced due to the effects of rural-urban migration. These developments have increased nutritional deprivation among many communities in Kwara State, where there is a serious struggle by parents to sustain three square meals for their children, which they need for growth and development. These further gathered by the researcher are affecting the pupils' food consumption in both government and private primary schools in Kwara State. This paper focused predominantly on factors affecting the status of nutrition for primary school children in Kwara State, Nigeria.

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diets are required for the functioning of proper cells, good immune system development and normal functioning of the brain in children. Many disorders in nutrition grow as a result of the nutrients that are deficient or taken abundantly. Survival and avoidance of malnutrition in a child require appropriate nutrition and satisfactory health care during the first few years of life [11].

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## 2. Methodology

This study assessed the factors affecting the status of nutrition for primary school pupils in Kwara State, Nigeria. The study considered the following stepwise phase: study design, the population of the study, sample and sampling technique, data collection instrument, validation of the instrument, reliability of the instrument, data collection procedure and data analysis.

### 2.1. Study Design

To assess the factors affecting the status of nutrition among primary school pupils in Kwara State, Nigeria, a descriptive design survey type was used for the study. Patrick [13] observed that this design will allow the researcher to define an event, condition or phenomenon as it is at the time of the study. The study submitted that this research design focuses on people, their beliefs, attitudes and behaviour and it also helps the researcher to systematically document current opinions and information on his work. The design was appropriate for this study because it permitted the gathering of information from a large population in a relatively quick and inexpensive way.

## 2.2. Population of the Study

The population of this study consisted of all the pupils in both public and private primary schools in Kwara State, Nigeria. The total population of the pupils as of the 2017/2018 academic session was estimated to be 818,554 pupils (Kwara State Ministry of Education, 2018).

## 2.3. Sample and Sampling Technique

The total sample that was used in this study consists of 1,322 pupils. This is in line with the Research Advisors (2006) which suggested that for a population of 500,000 people, 384 respondents will be adequate as a sample of the study. However, in this study, 1,322 respondents participated so that the study can cover as many respondents as possible that will make the sample truly representative. To select the required sample for this study, a multi-stage sampling procedure was used. First, the state consists of 16 local government areas, i.e. Asa, Baruten, Edu, Ekiti, Ifelodun, Ilorin East, Ilorin South, Ilorin West, Irepodun, Isin, Kaiama, Moro, Offa, Oke-Ero, Oyun and Patigi. In each local government, a simple random sampling technique of the hat-drawn method was used to select two primary schools (One Public and One Private Primary school). That is, the names of the Primary Schools in Kwara State were written on slips of paper. The slips were then folded and put in a container. After thorough shuffling, the researcher requested a neutral person outside the study population to dip his hand into the container and picked one slip at a time from each zone. The slips were unfolded and the local government it contains was recorded. This process was repeated until the required numbers of primary schools were drawn (two from each local government area). The reason for that was to ensure that the study cut across all the primary schools in Kwara State without any preference. Secondly, a proportionate sampling of 50 percent (Ratio 1:2) was then used to select the respondents from each of the selected schools. This is further to ensure that a representative number of samples are obtained. Pupils in the upper basic (Primary 4, 5 and 6) were eligible to participate in the

study because they fell between the ages of 5-19 years, which are the recommended ages by the World Health Organization.

## 2.4. Data Collection Instrument

The researcher developed a questionnaire on Factors Affecting Nutritional Status among Primary School Pupils in Kwara State, Nigeria, (RFNSP-Q). The questionnaire was categorised into the following sections: A, B, C, D, E and F

**Section A:** sought information on demographic data of the respondents.

**Section B:** sought information on parental income as a factor affecting nutritional status

**Section C:** sought information on parental education as a factor affecting nutritional status

**Section D:** sought information on parental nutritional knowledge as a factor affecting nutritional status

**Section E:** sought information on food security as a factor affecting nutritional status

**Section F:** sought information on birth order as a factor affecting nutritional status

A modified Likert Scale of Strongly Agree, Agree, Disagree and Strongly Disagree was used to collect data for sections B to F, i.e.

Strongly Agree (SA)-4 points, Agree (A)-3 points, Disagree (D)-2 points, Strongly Disagree (SD) -1 point. The decision criteria used in this study was 2.5 mean score respondents below this is deemed to have a negative response, while those with 2.5 mean scores and above were deemed to have a positive response.

## 2.5. Validation of the Instrument

The validity of the instrument was ascertained after four (4) copies of the questionnaire were given to four lecturers in the Department of Physical and Health Education, Bayero University, Kano for vetting. Their corrections, advice, suggestions and criticisms were incorporated into the final draft of the questionnaire to the satisfaction of the researcher's supervisor before testing.

**Table 1. Kwara State Enrolment List for 2017/2018 Academic Session**

Senatorial	LGA	Public Pri. Sch. Enrolment	Private Pri. Sch. Enrolment	Total Enrolment
Kwara North	Baruten	20,177	37,150	57,327
	Edu	47,392	35,736	83,128
	Patigi	14,140	19,932	34,072
	Moro	22,820	19,292	42,752
	Kaiama	19,206	22,032	41,238
	Ekiti	3,840	9,724	13,564
	Oke-Ero	4,023	10,214	14,237
Kwara South	Ifelodun	45,831	36,543	82,374
	Irepodun	16,065	26,353	42,418
	Offa	12,064	15,903	19,603
	Oyun	7,245	16,715	23,960
	Asa	22,102	22,422	44,524
Kwara Central	Ilorin East	50,071	36,235	86,306
	Ilorin South	22,300	37,005	59,305
	Ilorin West	81,756	64,664	146,420
	Total	398,045	420,509	818,554

Table 2. Sample Size from Each School Used for the Study

S/N	LGA	Name of Primary School	Status	Population of Primary 4, 5, & 6 pupils	Sample
	Asa	Apex Nursery & Pry School, Along Ogbomosho	Private	43	21
		Aboto Oja LGEA, Primary Sch, Aboto Oja	Public	89	44
	Baruten	CAC Nursery & Pry School, Chikanda	Private	8	4
		Ansarul Islam Pry & Chikanda	Public	63	31
	Edu	Faki Islamic Nursery & Pry School, Lafiagi, Behind Ministry of Work	Private	83	41
		Edu LGEA Primary School	Public	104	52
	Ekiti	Christiana Nursery and Pry School, Koro Eruku Road	Private	68	34
		C.A.C Primary School Osi	Public	160	80
	Ifelodun	Anuoluwa Nursery & Pry. School behind Deeper Life Church Ganmo	Private	61	30
		Baptist LGEA School Igbaja	Public	188	94
	Ilorin East	Adeyemo Memorial Nursery & Primary Near TEXACO Filling Station Sobi	Private	73	36
		Okelele A LGEA Pry School, Okelele	Public	243	121
	Ilorin South	Upright Child Montessori School, CBN Quarter junction Pipeline	Private	98	49
		Agbabiaka LGEA Pry School, Agbabiaka	Public	111	55
	Ilorin West	Effective Nursery & Pry School Taiwo Road	Private	159	79
		Alore A Pry School, Alore	Public	172	86
	Irepodun	Victory Nursery & Primary School, Arandun	Private	19	9
		Community Primary School Rore	Public	58	29
	Isin	Green Pasture Academy, Ijara Isin	Private	5	5
		Community LGEA School, Eleyin Isanlu	Public	62	31
	Kaiama	Kajola Nursery and Primary School Bani	Private	29	24
		Kajola LGAE Primary School, Gneria	Public	74	37
	Moro	Bukunmi Victory Group of School, Bode Saadu	Private	7	7
		Adaara LGEA Primary School, Moro	Public	46	23
	Offa	Glorious Land Nursery & Primary School ring Road, Offa	Private	63	31
		Iyeru Okin A/C LGEA, Primary School, Offa	Public	106	53
	Oke-Ero	Living Seed Nursery & Primary School Orisunbare	Private	23	11
		Community Primary School, Egosile	Public	56	28
	Oyun	Baptist Primary School Erin-Ile	Private	59	29
		Ansaru-ud deen 'A' LGEA Primary Ijagbo	Public	198	99
	Patigi	Al nursery and Primary School Lade	Private	9	9
		LGEA Primary School, Darul Islam Kpada	Public	81	40
				2644	1322

## 2.6. Ethical Consideration

Approval was acquired from the appropriate establishments in the studied school. Oral permission was obtained from their class teachers before the commencement of the study. Assent of the respondents and consent of their parents were also implored and gotten to carry out and publish this study. All authors hereby declare that the study has been duly examined and approved by the Department of Physical and Health Education, Faculty of Education, Bayero University, Kano State, Nigeria.

## 3. Results and Discussion

The paper assesses the factors affecting the status of nutrition of primary school pupils in Kwara State, Nigeria. One Thousand Three Hundred and Twenty-Two (1322) copies of the questionnaire were distributed. A total of 1320 copies of the questionnaire were properly filled while 2 copies (0.01%) were not properly filled and hence could not be used for the analysis. The analysis was presented in tables and explained thereafter. Table 3 showed the frequencies and percentages of demographic characteristics of the respondents. Table 4 to Table 9 presented answers to the six research questions with the

use of descriptive statistics of mean, the pupils' BMI distribution, weight, height readings and standard derivations. While other tables presented the result of the hypotheses tested to assess the factor variables relating to the existing nutritional status of children between 5-19 years. All hypotheses were tested at 0.05 level of significance.

Table 3 shows that as far as school type is concerned, Four Hundred and Ninety-Three (37.30%) were from private schools, while Eight Hundred and Twenty Seven (62.7%) were in public schools, this shows that the majority of the respondents used were from the public primary. Nine Hundred and Forty-Eight (71.8%) of the pupils were from schools located in urban areas, while Three Hundred and Seventy-Two (28.2%) were from schools located in rural areas, that is the majority of the school used were from urban settlements. Six Hundred and Sixty Nine (51.4%) were male pupils, while Six Hundred and Forty-One (48.6%) were female pupils, this shows that the study was distributed across males and females with a difference of 38 numbers boys over female respondents. Pupils' ages range from 1 to 5, using age distribution intervals of 5, 6, 7 (1); 8, 9, 10 (2); 11, 12, 13 (3); 14, 15, 16 (4); and 17, 18, 19 (5) respectively, this shows that the respondents between age bracket 8, 9 and 10 have the highest population of 68%, while aged 11, 12 and 13; 5, 6 and 7; 14, 15 and 16 and 17, 18 and 19 had 2<sup>nd</sup>, 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> in population position respectively. With

respect to mother's level of education, it was observed that 149 (11.3%); 311 (23.6%); 393 (29.8%); 467 (35.4%) of the mothers possess no schooling, have primary education, secondary education, tertiary education respectively while 215 (16.3%), 463 (35.1%); 343 (26.0%); 299 (22.7%) of the fathers possess no schooling, but have primary education, secondary education, tertiary education respectively. The frequency and percentage distribution of parental economic status reveal that a large number, 494 (37.4%) are unemployed, the majority 579 (43.9%) are farmers/traders, while 211 (16.0%) have shops where they sell goods and services.

**Table 3. Frequencies and Percentages of Demographic Information of the Respondents**

School Type	Frequency	Percentage (%)
Private	493	37.3
Public	827	62.7
Total	1320	100.0
School Location		
Urban	948	71.8
Rural	372	28.2
Total	1320	100.0
Gender		
Male	679	51.4
Female	641	48.6
Total	1320	100.0
Class		
Primary 4	464	35.2
Primary 5	576	43.6
Primary 6	280	21.2
Total	1320	100.0
Age		
1.00	143	10.8
2.00	903	68.4
3.00	168	12.7
4.00	82	6.2
5.00	24	1.8
Total	1320	100.0
Birth Order		
1 <sup>st</sup> Born	221	16.7
2 <sup>nd</sup> Born	269	20.4
3 <sup>rd</sup> Born	314	23.8
4 <sup>th</sup> Born	342	25.9
5 <sup>th</sup> Born	174	13.2
Total	1320	100.0
Parental education level (Father)		
No Schooling	215	16.3
Primary school	463	35.1
Secondary school	343	26.0
Tertiary	299	22.7
Total	1320	100.0
Parental education level (Mother)		
No Schooling	149	11.3
Primary school	311	23.6
Secondary school	393	29.8
Tertiary	467	35.4
Total	1320	100.0
Parental Economic Status		
Fully Employed	36	2.7
Trader	211	16.0
Farmer/Self Employed	579	43.9
Unemployed	494	37.4
Total	1320	100.0

## 4.1. Results of Research Question Testing

**Research Question 1:** Is parental nutrition knowledge a factor in nutritional status among primary school pupils in Kwara State, Nigeria?

Table 4 shows the parent's nutrition knowledge and the pupil's nutritional status. This reveals the frequency and percentage scores of parents' responses on nutrition knowledge. 240 parents, who represented 18.8% agreed to know food classification, while 1080 (81.2%) were not knowledgeable. 304 (23%) agreed to know about feeding based on health needs, while 1016 (77%) were not knowledgeable. 568 (43%) agreed to know food guides, while 752 (57%) were not knowledgeable. 509 (38.6%) agreed that milk is not important for child growth, while 811 (61.4%) agreed that milk is important for child growth and 322 (24.4%) agreed to know the importance of fruits, while 998 (75.6%) were parents that do not know the health benefit of fruit to child health respectively. This implies that a lack of nutrition knowledge contributes to a high rate of underweight disorders among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the nutritional status of primary school pupils in Kwara State.

**Research Question 2:** Is parental income a factor of nutritional status among primary school pupils in Kwara State, Nigeria?

Table 5 shows the parent income and the pupil's nutritional status. 742 (56.2%) were parents who could not afford quality food based on their low income, while 578 (43.8%) could afford quality food. 611 (46.3%) were parents that have many burdens on their income, while 709 (53.7%) were that have a light burden on income. 846 (64.1%) believe that fresh fruit is expensive based on their low income, while 474 (35.9%) believe that fruits are not expensive. 672 (51%) were parents who could afford to buy imported food based on a low income, while 648 (49%) could afford to buy important food nutrients and 568 (43%) could not afford three –square meals for their child based on their low income, while 752 (57%) able to afford three-square meals for their child. This implies that low parental income contributes to the high rate of underweight disorder among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the nutritional status of primary school pupils in Kwara State.

**Research Question 3:** Is parental education a factor in nutritional status among primary school pupils in Kwara State, Nigeria?

Table 6 shows the parental education and the pupil's nutritional status. 856 (64.8%) were parents that have no education, while 464 (35.2%) were educated parents who responded that education influences child growth. 652 (49.4%) were parents that have no education, while 668 (50.6%) were educated parents who responded to the influences of education on their food choice. 801 (60.7%) were parents that have no education, 519 (39.3%) were educated parents that responded to the influence of education on food proportion, 715 (54.2%) were parents with no education, while 605 (45.8%) were educated parents that response to the influence of education on food process. 689 (52.2%) were parents with no education, which influences their food culture. 464 (35.2%) were



educated parents, which influences the child's growth. 668 (50.6%) were educated parents, which influences their choice of food. 519 (39.3%) were educated parents that influence their food proportion, while 631 (47.8%) were educated parents who responded to the influence of education on food culture. This implies that low parental education contributes to the high rate of underweight disorder among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the nutritional status of primary school pupils in Kwara State.

**Research Question 4:** Is food security a factor of nutritional status among primary school pupils in Kwara State, Nigeria?

Table 7 shows the food security and the status of pupils' nutrition. 876 (66.4%) of the parents have no secure source for quality food, while 444 (33.6%) were parents that have secure sources of food. 826 (62.6%) of the parents have no access to fresh food within their compound, while 494 (37.4%) have a fruit garden within their compound. 758 (57.4%) of the parents have no secure source of clean water, while 562 (42.6%) were parents that have a secure source of clean water. 694 (54.8%) of the parents have no secure source for affordable food, while 626 (45.8%) were parents that have access to affordable food. 594 (45%) have fear of getting food, while 726 (55%) were parents that have no fear of getting food. This implies that food insecurity contributes to the high rate of underweight disorder among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the status of nutrition for primary school pupils in Kwara State.

**Research Question 5:** Is intestinal parasitic infection a factor of nutritional status among primary school pupils in Kwara State, Nigeria?

Table 8 shows the intestinal parasitic infection and the pupil's nutritional status. 358 (27.1%) were parents that have not treated worm infections within the past three months, while 962 (72.9%) were parents that have treated worm infections for their child within the past three months. 417 (3.6%) were parents that have not been

treated for diarrhea infection for the past three months, while 903 (68.4%) were parents that have been treated for diarrhea infection for their child in the past three months. 352 (26.7%) were parents whose children are not always complaining about stomach upset, while 968 (73.3%) were parents whose children always complain about stomach upset. 449 (34%) were parents who have not been admitted to the hospital for the past three months, while 871 (66%) were parents whose children have been admitted to the hospital within the past three months. 298 (22.6%) were parents whose children are not on medication, while 1022 (77.4%) were parents whose children are on continuous medication. This implies that intestinal parasitic infection contributes to a high rate of underweight disorder among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the status of nutrition of primary school pupils in Kwara State.

**Research Question 6:** Is birth order a factor of nutritional status among primary school pupils in Kwara State, Nigeria?

Table 9 shows birth order and the pupil's nutritional status. 458 (34.7%) were the parent that agreed to distribute appropriately among their child, while 862 (65.3%) were parents that disagreed with distributing appropriately among their children. 342 (25.9%) were parents that have no preference for a particular sex child, while 978 (74.1%) were parents that have a preference for a particular sex child. 329 (24.9%) were parents who disagreed that many children are an investment, while 991 (75.1%) were parents who agreed that many children are an investment. 382 (28.9%) were parents that believe in child spacing practice, while 938 (71.1%) were parents that do not believe in child spacing practice. 413 (31.3%) were parents that support childbirth control practice, while 907 (68.7%) were parents that do not support childbirth control practice. This implies that intestinal parasitic infection contributes to a high rate of underweight disorder among primary school pupils in Kwara state. Hence, parental nutrition knowledge is a risk factor affecting the status of nutrition for primary school pupils in Kwara State.

**Table 4. Frequencies and Percentages of Pupils' Nutritional Status and Parental Nutrition Knowledge**

Nutritional Status	Parental Nutrition Knowledge		Total
	Knowledgeable	Not Knowledgeable	
I know classification of food and their functions	240 (18.8%)	1080 (81.2%)	1320
I feed my child based on his/her health needs	304 (23%)	1016 (77%)	1320
I follow Food Guide in feeding my child	568 (43%)	752 (57%)	1320
I know the importance of milk to my child's growth	509 (38.6%)	811 (61.4%)	1320
I ensured that my child takes fruit regularly	322 (24.4%)	998 (75.6%)	1320

**Table 5. Frequencies and Percentages of Pupils' Nutritional Status and Parental Income**

Nutritional Status	Parental Income		Total
	Low	Moderate	
My wish on quality of food is being met	742 (56.2%)	578 (43.8%)	1320
I have more important things to use the money for than food	709 (53.7%)	1320	611 (46.3%)
Fruit is too expensive	846 (64.1%)	474 (35.9%)	1320
I can afford to buy milk and other important food	672 (51%)	648 (49%)	1320
I always ensure three-square meals for my child everyday	568 (43%)	752 (57%)	1320

**Table 6. Frequencies and Percentages of Pupils' Nutritional Status and Parental Education**

Nutritional Status	Parental Education		Total
	Not Educated	Educated	
Growth of my child	856 (64.8%)	464 (35.2%)	1320
Choice of food for my child	652 (49.4%)	668 (50.6%)	1320
Proportion of food that I serve my child	801 (60.7%)	519 (39.3%)	1320
Process of my child's food	715 (54.2%)	605 (45.8%)	1320
Practices, attitudes & beliefs on food consumption	689 (52.2%)	631 (47.8%)	1320

**Table 7. Frequencies and Percentages of Pupils' Nutritional Status and Food Security**

Nutritional Status	Food Security		Total
	Not Secured	Secured	
I have reliable access to quality food	876 (66.4%)	444 (33.6%)	1320
I have access to fresh food within my garden	826 (62.6%)	494 (37.4%)	1320
I have access to clean water and food	758 (57.4%)	562 (42.6%)	1320
I have access to affordable food	694 (54.8%)	626 (45.8%)	1320
I have no fear in getting food	594 (45%)	726 (55%)	1320

**Table 8. Frequencies and Percentages of Pupils' Nutritional Status and Intestinal Parasitic Infection**

Nutritional Status	Intestinal Parasitic Infection		Total
	Not Treated	Treated	
My child was treated for worm infections	358 (27.1%)	962 (72.9%)	1320
My child was treated for diarrhea	417 (31.6%)	903 (68.4%)	1320
My child always complains of stomach ache	352 (26.7%)	968 (73.3%)	1320
My child was admitted to the hospital	449 (34%)	871 (66%)	1320
My child is on continuous medication	298 (22.6%)	1022 (77.4%)	1320

**Table 9. Frequencies and Percentages of Pupils' Nutritional Status and Birth Order**

Nutritional Status	Birth Order		Total
	Agreed	Disagreed	
I distribute equally among children	458 (34.7%)	862 (65.3%)	1320
I have preference for the sex of my child	342 (25.9%)	978 (74.1%)	1320
Many children are investment	329 (24.9%)	991 (75.1%)	1320
I support child spacing	382 (28.9%)	938 (71.1%)	1320
I encourage childbirth control is necessary	413 (31.3%)	907 (68.7%)	1320

## 4.2. Results of Hypotheses Testing

### (i) Major Hypothesis:

There is no significant relationship between the factors and nutritional status of primary school pupils in Kwara State, Nigeria.

**Table 10. Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.042 <sup>a</sup>	.002	-.003	3.64758

a. Dependent Variable: Body Max Index

b. All requested variables were entered.

**Table 11. Analysis of Variance (ANOVA) for the factors influencing the Nutritional Status of Primary School Pupils in Kwara State, Nigeria**

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	30.751	6	5.125	.385	.889 <sup>b</sup>
1 Residual	17469.222	1313	13.305		
Total	17499.972	1319			

a. Dependent Variable: Body max Index

b. Predictors: (Constant), Total, Fstotal, pnktotal, IPI total, PE total, PI total

**Table 12. Coefficients Table of the dependent on independent variable Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	17.310	1.006		17.211	.000
Parental Nutrition Knowledge	-.009	.043	-.006	-.211	.833
Parental Income	-.043	.061	.033	-.715	.475
1 Parental Education	-.018	.053	-.014	-.338	.735
Food Security	.044	.042	.029	1.044	.297
Intestine Parasitic Infections	-.003	.046	-.003	-.072	.947
Order Birth	.044	.055	.030	.797	.425

(a) Dependent Variable; Body mass Index.

The multiple linear regression was conducted to investigate whether risk factors of nutritional status could predict the nutritional status of primary school pupils in Kwara State, Nigeria. Correlation Coefficient ( $r$ ) is .042, while the  $p$ -value is 0.001 and the total number of cases was 1319. Since  $r = .042$ , there exists a weak relationship between the risk factors and nutritional status. This implies that risk factors cannot predict nutritional status by an increase of 42%. Since the  $p$  is 0.001 is  $< 0.05$  level significance, the null hypothesis is rejected on the account that a weak significant relationship exists between the risk factors and the nutritional status. since  $r$  is .042, there exists a weak relationship;  $r^2$  is a coefficient of determination is 0.002. The amount of variation explained the risk factors contribute 2% to nutritional status, while the remaining 98% is the contribution of other factors not included in this study. Adjusted  $r^2$  test goodness of fit equal to -.003 is negative fit,  $sp$  from ANOVA is .889  $F(6, 1313)$  equal to .385. All the risk factors did not contribute to nutritional status  $p > 0.05$ . Multiple regression was run to predict nutritional status from parental nutrition knowledge, parental income, parental education, food security, intestinal parasitic infections and birth order. These variables did not predict the nutritional status of primary school pupils  $F(6, 1313) = .385$ ,  $p > 0.05$ ,  $R^2 = .002$ .

### (ii) Sub-Hypothesis 1

Parental nutrition knowledge is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria. Summary of Chi-Square Analysis on Parental Nutrition Knowledge as a factor of nutritional status among primary school pupils.

**Table 13. Chi-Square Result on Parental Nutritional Knowledge as a Nutritional Factor**

	FO	FE	%	$\chi^2$	df	P-value
	240	660	18.2%	791.351	1	0.001
	1080	660	81.8%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

Table 13 summarizes the Chi-Square analysis of parental nutrition knowledge as a factor of nutritional status among primary school pupils. The table shows that 240(18.2%) of the parents have nutrition knowledge, while 1080 (81.8%) have no nutritional knowledge. Statistical analysis indicated a  $\chi^2$  value of 791.351, at

$df=1$  and since  $P < 0.05$ , the null hypothesis is therefore accepted. This implies that parental nutrition knowledge is not a significant risk factor for nutritional status among primary school pupils in Kwara State, Nigeria. This was earlier shown in Table 4, that parents without nutrition knowledge have 742 (56%) of their children stunted/wasted, and only 304 (23%) are considered of normal weight/height. Therefore, the test result shows that parental nutrition knowledge is a weak risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

### (iii) Sub-Hypothesis 2

Parental income is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria. Summary of Chi-Square Analysis on Parental Income as a factor of nutritional status among primary school pupils.

**Table 14. Chi-Square Result on Parental Income as a Nutritional Factor**

	FO	FE	%	$\chi^2$	df	P-value
	1038	660	78.6%	726.259	1	0.001
	282	660	21.4%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

Table 14 summarizes the Chi-Square analysis of parental income as a factor of nutritional status among primary school pupils. The table shows that 282 (21.4%) of the respondents' parents are having a moderate income while 1038 (78.6%) are having a low income. Statistical analysis indicated  $\chi^2$  value of 726.259, at  $df=1$  and  $P < 0.05$ . The null hypothesis is therefore rejected. This implies that Parental income is a significant risk factor for nutritional status among primary school pupils in Kwara State, Nigeria. The data indicated that pupils from low-income parents suffer more nutritional status problems. Therefore, there is a significant difference in the observed and expected frequencies. Therefore, the test result shows that parental income is a weak risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

### (iv) Sub-Hypothesis 3

Parental education is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria. Summary of Chi-Square Analysis on Parental Education as a factor of nutritional status among primary school pupils.



**Table 15. Chi-Square Result on Parental Education as a Nutritional Factor**

	FO	FE	%	$\chi^2$	df	P-value
	412	660	31.2%	734.063	1	0.000
	908	660	68.8%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

Table 15 summarizes the Chi-Square analysis on parental education as a factor of nutritional status among primary school pupils. The table shows that 412 (31.2%) of the respondents' parents are educated while 908 (68.8%) are not educated. Statistical analysis indicated  $\chi^2$  value of 734.063, at  $df=1$  and  $P < 0.05$ . The null hypothesis is therefore accepted. This implies that parental education is not a significant risk factor for nutritional status among primary school pupils in Kwara State, Nigeria. Therefore, the test result shows that parental education is a significant risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

#### (v) Sub-Hypothesis 4

Food security is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria. Summary of Chi-Square Analysis on Food Security as a factor of nutritional status among primary school pupils.

**Table 16. Chi-Square Result on Food Security as a Nutritional Risk Factor**

	FO	FE	%	$\chi^2$	df	P-value
	315	660	23.9%	765.084	1	0.000
	1005	660	76.1%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

Table 16, summarizes the Chi-Square analysis on food security as a factor of nutritional status among primary school pupils. The table shows that 315 (23.9%) of the respondents' parents are having secured means of food while 1005 (76.1%) are having an unsecured source of food. Statistical analysis indicated  $\chi^2$  value of 765.084, at  $df=1$  and  $P < 0.05$ . The null hypothesis is therefore accepted. This implies that food security is a significant risk factor for nutritional status among primary school pupils in Kwara State, Nigeria. Therefore, the test result shows that food security is a weak risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

#### (iv) Sub-Hypothesis 5

Intestinal parasitic infection is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria.

Summary of Chi-Square Analysis on Intestinal Parasitic Infection as a factor of nutritional status among primary school pupils.

Table 17 summarizes the Chi-Square analysis of Intestinal Parasitic condition as a factor of nutritional status among primary school pupils. The table shows that 211 (16.0%) of the respondents were not treated for

Intestinal Parasitic related diseases in the past three months ago, while 1109 (84.0%) were treated for nutritional-related diseases recently. Statistical analysis indicated  $\chi^2$  value of 769.000, at  $df=1$  and  $P < 0.05$ . The null hypothesis is therefore rejected. This implies that the Intestinal Parasitic condition is a significant risk factor for nutritional status among primary school pupils in Kwara State, Nigeria. This was earlier shown in Table 5., that 737 (56%) were pupils that have been treated for intestinal parasitic infections within the last three months and shown stunted/wasted growth, while only 340 (26%) were normal growth. Therefore, there is a significant difference in the observed and expected frequencies. Table 6 and Table 7 show the relationship between intestinal parasitic infection and pupils' nutritional status, where  $r$  is 0.942, which measures the strength and direction of a linear relationship between intestinal parasitic infection and pupils' nutritional status. The test result shows that intestinal parasitic infection is a risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

**Table 17. Chi-Square Result on Intestinal Parasitic Infection as a Nutritional Factor**

	FO	FE	%	$\chi^2$	df	P-value
	211	660	16.0%	769.000	1	0.001
	1109	660	84.0%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

#### (vii) Sub-Hypothesis 6

Birth order is not a significant factor in nutritional status among primary school pupils in Kwara State, Nigeria. Summary of Chi-Square Analysis on Birth Order as a factor of nutritional status among primary school pupils.

**Table 18. Chi-Square Result on Birth Order as a Nutritional Factor**

	FO	FE	%	$\chi^2$	df	P-value
	926	660	29.8%	779.019	1	0.001
	324	660	70.2%			
Total	1320		100%			

( $P < 0.05$ ), Significant.

Table 18 summarizes the Chi-Square analysis on birth order as a factor of nutritional status among primary school pupils. The table shows that 324 (29.8%) of the respondents are among the last born of their family, while 926 (70.2%) are among the firstborn of their family. Statistical analysis indicated  $\chi^2$  value of 779.019, at  $df=1$  and  $P < 0.05$ . The null hypothesis is therefore rejected. This implies that those pupils born among the last birth order suffer a high rate of nutritional-related problems since care and attention have been drawn away from them, however, poor birth spacing, poor childbirth control or poor family planning increases the nutritionally related problem, while less care and attention were given. Therefore, the test result shows that birth order is a risk factor for the status of nutrition for primary school pupils in Kwara State, Nigeria.

## 4. Conclusion

Nutrition is the biochemical and physiological process by which a person uses food to support his or her life, this contains ingestion, absorption, assimilation, biosynthesis, catabolism and excretion. This paper assessed and identified the relationship between risk factors that influenced the nutritional status of primary school pupils in Kwara State, Nigeria. The frequencies and percentages of demographic characteristics of the respondents on the age, sex, birth order, class, school status, parent's level of education and socioeconomic status. Six research questions with the use of descriptive statistics of mean and standard Deviations were conducted. The result relates to the relationship of risk factor variables with the existing nutritional status of children between 5-19 years. All hypotheses were tested using ANOVA at 0.05 level of significance. The population of the study was 740,945 pupils aged 5-19 years (Kwara State Ministry of Education, 2017). The sample size of the study was 1320 primary school pupils. Multi-stage sampling technique was used to select participants for the study. These were stratified random, proportionate and purposive sampling techniques. Three different instruments were used for data collection. An adapted questionnaire titled risk factors of nutritional status of primary school pupils in Kwara states, Nigeria was purposively distributed to pupils to information about their demographic information, a weighing scale was also used to measure weight and an infant meter/height meter was also used to measure the length/height of the pupil. Frequency counts and percentages were used to describe the demographic characteristics of respondents. Means and standard deviations were used to answer the research questions. The data generated were analyzed using ANOVA to determine the relationship of the risk factor variables of parents' levels of education, nutritional knowledge, income, intestinal parasitic infection, food security and birth order on primary school pupils' nutritional status. Six sub-hypotheses were formulated and tested at 0.05 alpha levels. Findings showed that 66.7%, 29.9%, 3.1% and 0.2% were underweight, normal, overweight and obese respectively. Furthermore, several social and economic

variables that positively influenced children's nutritional status were identified.

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